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Coeur D'Alene Lake
Benewah and Kootenai Counties, Idaho

National Eutrophication Survey, Las Vegas, Nev

Prepared for

Environmental Monitoring and Support Lab, Las Vegas, Nev

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16. ABSTRACT
Annual total phosphorus and total nitrogen loadings to the lake were estimated and subdivided according to either point or non-point source origin. An assessment of the lake's trophic condition and limiting nutrient is also provided. All data collected by the U.S.E.P.A. National Eutrophication Survey during the one year study of the lake and its tributaries are included in the report.

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REPORT

ON

COEUR D'ALENE LAKE

BENEWAH AND KOOTENAI COUNTIES

IDAHO

EPA REGION X

WORKING PAPER No. 778

WITH THE COOPERATION OF THE

IDAHO DEPARTMENT OF HEALTH AND WELFARE

AND THE

IDAHO NATIONAL GUARD

JULY, 1977

REPORT ON COEUR D'ALENE LAKE

BENEWAH AND KOOTENAI COUNTIES, IDAHO

EPA REGION X

by

National Eutrophication Survey

Water and Land Quality Branch
Monitoring Operations Division
Environmental Monitoring & Support Laboratory
Las Vegas, Nevada

and

Special Studies Branch
Corvallis Environmental Research Laboratory
Corvallis, Oregon

Working Paper No. 778

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U.S. ENVIRONMENTAL PROTECTION AGENCY

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FOREWORD

The National Eutrophication Survey was initiated in 1972 in response to an Administration commitment to investigate the nationwide threat of accelerated eutrophication to freshwater lakes and reservoirs.

OBJECTIVES

The Survey was designed to develop, in conjunction with state environmental agencies, information on nutrient sources, concentrations, and impact on selected freshwater lakes as a basis for formulating comprehensive and coordinated national, regional, and state management practices relating to point source discharge reduction and nonpoint source pollution abatement in lake watersheds.

ANALYTIC APPROACH

The mathematical and statistical procedures selected for the Survey's eutrophication analysis are based on related concepts that:

a. A generalized representation or model relating sources, concentrations, and impacts can be constructed.

b. By applying measurements of relevant parameters associated with lake degradation, the generalized model can be transformed into an operational representation of a lake, its drainage basin, and related nutrients.

c. With such a transformation, an assessment of the potential for eutrophication control can be made.

LAKE ANALYSIS

In this report, the first stage of evaluation of lake and watershed data collected from the study lake and its drainage basin is documented. The report is formatted to provide state environmental agencies with specific information for basin planning [§303(e)], water quality criteria/standards review [§303(c)], clean lakes [§314(a,b)], and water quality monitoring [§106 and §305(b)] activities mandated by the Federal Water Pollution Control Act Amendments of 1972.

Beyond the single lake analysis, broader based correlations between nutrient concentrations (and loading) and trophic condition are being made to advance the rationale and data base for refinement of nutrient water quality criteria for the Nation's freshwater lakes. Likewise, multivariate evaluations for the relationships between land use, nutrient export, and trophic condition, by lake class or use, are being developed to assist in the formulation of planning guidelines and policies by the U.S. Environmental Protection Agency and to augment plans implementation by the states.

ACKNOWLEDGMENTS

The staff of the National Eutrophication Survey (Office of Research and Development, U.S. Environmental Protection Agency) expresses sincere appreciation to the Idaho Department of Health and Welfare for professional involvement, to the Idaho National Guard for conducting the tributary sampling phase of the Survey, and to those Idaho wastewater treatment plant operators who provided effluent samples and flow data.

The staff of the State of Idaho Department of Health and Welfare, Division of Environment, provided invaluable lake documentation and counsel during the Survey, reviewed the preliminary reports and provided critiques most useful in the preparation of this Working Paper Series.

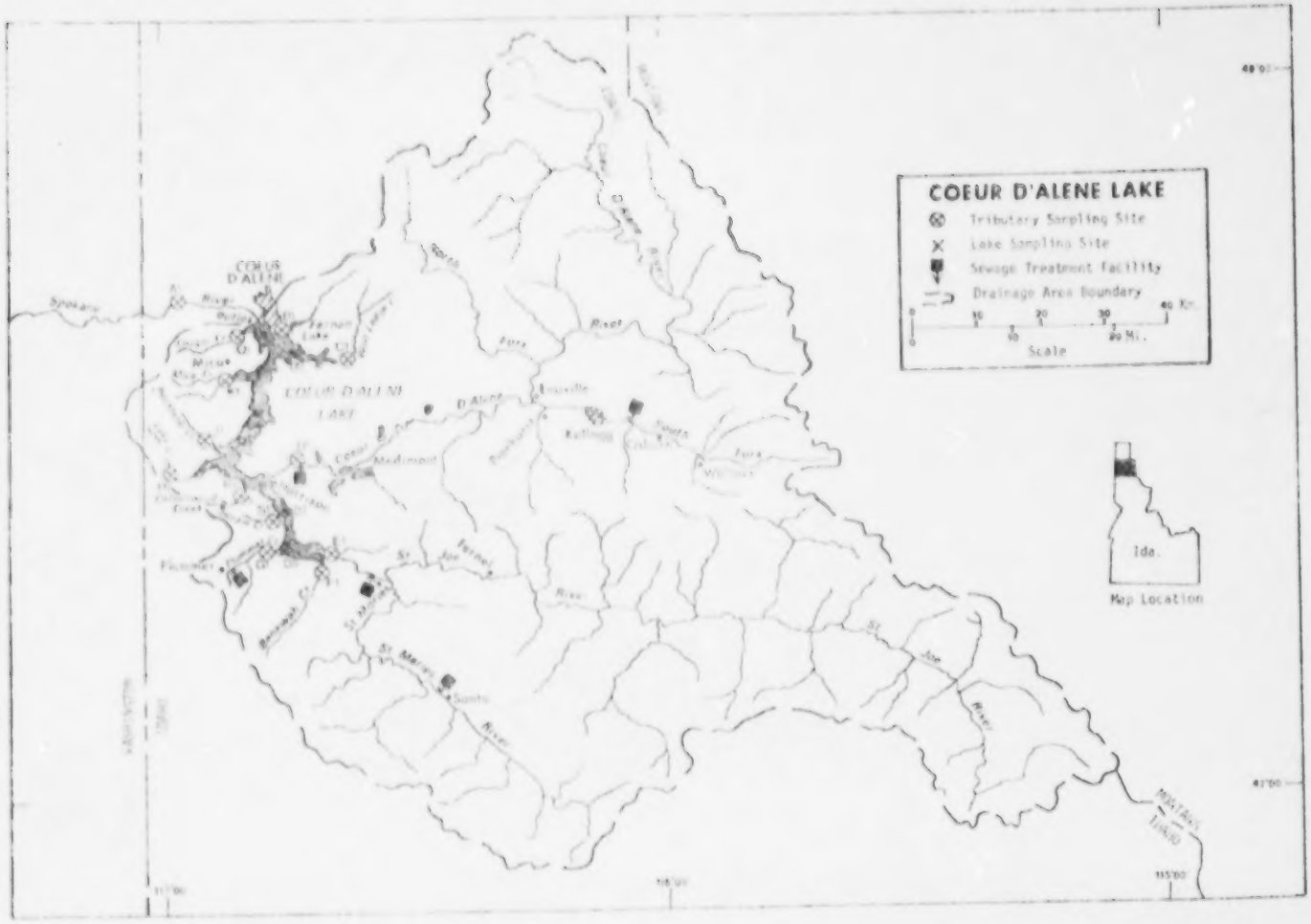
Major General James S. Brooks, Adjutant General of Idaho, and Project Officer Major Vestal L. Baker, who directed the volunteer efforts of the Idaho National Guardsmen, are also gratefully acknowledged for their assistance to the Survey.

NATIONAL EUTROPHICATION SURVEY

STUDY LAKES

STATE OF IDAHO

LAKE NAME	COUNTY
American Falls Reservoir	Bannock, Bingham, Power
Cascade Reservoir	Valley
Coeur d'Alene Lake	Benewah, Kootenai
Dworshak Reservoir	Clearwater
Hauser Lake	Kootenai
Hayden Lake	Kootenai
Island Park Reservoir	Fremont
Lake Lowell (Deer Flat Reservoir)	Canyon
Magic Reservoir	Blaine, Camas
Palisades Reservoir	Bonneville (Lincoln in WY)
Payette Lake	Valley
Lower Twin Lake	Kootenai
Upper Twin Lake	Kootenai


COEUR D'ALENE LAKE
Tributary Sampling Site
Lake Sampling Site
Sewage Treatment Facility
Drainage Area Boundary
Scale
Ida.
Map Location
COEUR D'ALENE LAKE
Spokane River
St. Joe River
St. Maries River
Montana
Idaho

REPORT ON COEUR D'ALENE LAKE, IDAHO

STORET NO. 1603

I. CONCLUSIONS

A. Trophic Condition:*

On the basis of Survey data and field observations Coeur d'Alene Lake is considered mesotrophic. Chlorophyll a values in the lake ranged from 1.9 µg/l to 32.1 µg/l with a mean of 10.4 µg/l. Oxygen levels remained high in the lake throughout the sampling year, and Secchi disc visibility was good except during spring runoff at the southernmost stations of the lake. Of the 13 Idaho lakes sampled during 1975, 8 had higher median total phosphorus levels (0.017 mg/l), 11 had higher median inorganic nitrogen values (0.040 mg/l) and 10 had higher median total phosphorus levels (0.005 mg/l) than Coeur d'Alene Lake.

Survey limnologists did not observe any problem conditions during their visits to the lake. However, Parker (1972) reports that blue-green algal growths and abundant macrophytes can be found in the shallower southernmost portions of the lake. He indicates that the deeper northern end acts as a semi-permanent nutrient sink and is generally considered oligotrophic in water quality, with a tendency towards eutrophication found in the shallow, well-developed southern end. Survey data tends

*See Appendix E.

to support this theory of overenrichment in the southern lake; during the spring sampling period, the mean total phosphorus level for Stations 01-03 was 0.025 mg/l, and for Stations 05-08 was 0.049 mg/l. Overenrichment in the lake is apparently a result of heavy recreational use, development of lakeshore residences and resorts around the lake and flush sewage from boats utilizing the lake (Parker, 1972). Other studies also indicate some heavy metal pollution in the lake from upstream mining activities on the Southfork Coeur d'Alene River (Idaho Department of Water Resources, et al., 1975; Idaho Department of Health and Welfare, 1975).

B. Rate-Limiting Nutrient:

The algal assay results were not considered representative of conditions in the lake at the times the samples were taken. The lake data indicate nitrogen limitation at all sampling stations during summer and at Stations 01-03 during spring. Phosphorus limitation was indicated at all Stations during fall, and at Stations 05-08 during spring.

C. Nutrient Controllability:

1. Point sources -

During the sampling year, point sources contributed 7.6% of the total phosphorus load to the lake. The South Fork Coeur d'Alene Sewer District contributed 5.3%, the St. Maries plant contributed 1.9%, and the remaining 0.4% was contributed by

three additional plants.

The calculated phosphorus loading of 1.39 g $P/m^2/yr$ was greater than that proposed by Vollenweider (1975) as "eutrophic" for a lake with such volume and retention time. The loading data suggest that 90% reduction of contributions from known point sources would lower nutrient loading to below this "eutrophic" level. Although Vollenweider's model may not be applicable to lakes with short hydraulic retention times (only 19 days for Coeur d'Alene Lake), the lake is demonstrating some localized tendency towards eutrophication and future development around the lake should be considered carefully in light of potential problem conditions arising from overenrichment. Examination of land use practices and identification of any additional point sources is needed before definitive recommendations on nutrient controllability in Coeur d'Alene Lake can be proposed.

2. Nonpoint sources -

Nonpoint sources contributed 92.4% of the total phosphorus load to Coeur d'Alene Lake during the sampling year. The Coeur d'Alene River contributed 54.6%, the St. Joe River contributed 31.3%, and ungaged drainage areas were estimated to have contributed 3.4% of the total phosphorus load.

The phosphorus export rates of tributaries to Coeur d'Alene Lake were comparable to nearby Twin Lakes* (range of 8-15 kg $P/km^2/yr$) with the exception of Coeur d'Alene River, which has a slightly higher export rate of 26 kg $P/km^2/yr$.

*See "Report on Upper and Lower Twin Lakes", Working Paper No. 787.

II. LAKE AND DRAINAGE BASIN CHARACTERISTICS:

Lake and drainage basin characteristics are itemized below. Lake surface area, mean depth and volume were provided by Martin and Hanson (1966). Maximum depth was estimated on the basis of National Eutrophication Survey (NES) sampling data. Tributary flow data were provided by the Idaho District Office of the U.S. Geological Survey (USGS). Outlet drainage area includes the lake surface area. Mean hydraulic retention time was obtained by dividing the lake volume by mean flow of the outlet. Precipitation values are estimated by methods as outlined in NES Working Paper No. 175. A table of metric/English conversions is included as Appendix A.

A. Lake Morphometry:

1. Surface area: 129.50 km^2.
2. Mean depth: 2.3 meters.
3. Maximum depth: 57.9 meters.
4. Volume: 294.187 x 10^6 m^3.
5. Mean hydraulic retention time: 19 days.

B. Tributary and Outlet:
(See Appendix B for flow data)

1. Tributaries -

Name	Drainage area (km^2)	Mean flow (m^3/sec)
C-1 Wolf Lodge Creek	153.1	1.48
D-1 Coeur d'Alene River	3,833.2	72.37
E-1 St. Joe River	4,480.7	96.11
F-1 Benewah Creek	137.0	0.71
G-1 Plummer Creek	112.4	0.31
H-1 Lake Creek	68.6	0.66
Minor tributaries and immediate drainage -	1,030.8	7.74
Totals	9,615.8	179.38
2. Outlet - A-1 Spokane River	9,945.6	176.52

C. Precipitation:

1. Year of sampling: 67.9 cm.
2. Mean annual: 66.1 cm.

III. LAKE WATER QUALITY SUMMARY

Coeur d'Alene Lake was sampled three times during the open-water season of 1975 by means of a pontoon-equipped Huey helicopter. Each time, samples for physical and chemical parameters were collected from eight stations on the lake (Station 04 was only sampled twice) and from a number of depths at each station (see map, page v). During each visit, depth-integrated samples were collected from each station for chlorophyll *a* analysis and phytoplankton identification and enumeration. During the first and last visits, 18.9-liter depth-integrated samples were composited for algal assays. Maximum depths (expressed in meters) sampled are listed below:

Station Number	Maximum Depth (meters)
01	18.6
02	34.1
03	56.4
04	36.6
05	32.9
06	15.8
07	15.2
08	8.2

For a more detailed explanation of NES methods, see NES Working Paper No. 175.

The results obtained are presented in full in Appendix C and are summarized in III-A for waters at the surface and at the maximum depth for each site. Results of the phytoplankton counts and chlorophyll *a* determinations are included in III-B. Results of the limiting nutrient study are presented in III-C.

LAKE COEUR D'ALENE
STORET CODE 1603

PHYSICAL AND CHEMICAL CHARACTERISTICS

PARAMETER	(4/ 4/75) S*** = 7 N*	RANGE	MEDIAN	MAX DEPTH RANGE (METERS)	(7/22/75) S*** = 8 N*	RANGE	MEDIAN	MAX DEPTH RANGE (METERS)	(9/ 9/75) S*** = 8 N*	RANGE	MEDIAN	MAX DEPTH RANGE (METERS)
TEMPERATURE (DEG CENT)												
0.-1.5 M DEPTH	14	3.3- 4.2	3.8	0.0- 1.5	16	18.8- 21.7	19.9	0.0- 1.5	16	17.3- 19.1	18.9	0.0- 1.5
MAX DEPTH**	7	3.4- 4.2	4.0	7.9- 56.4	8	4.3- 10.1	6.1	7.9- 54.3	8	7.0- 16.9	8.6	8.2- 53.3
DISSOLVED OXYGEN (MG/L)												
0.-1.5 M DEPTH	13	11.4- 13.0	12.6	0.0- 1.5	16	6.6- 9.7	9.2	0.0- 1.5	16	7.6- 10.0	9.0	0.0- 1.5
MAX DEPTH**	7	11.4- 12.8	12.0	7.9- 56.4	8	7.8- 10.6	8.6	7.9- 54.3	6	2.8- 8.6	7.3	8.2- 53.3
CONDUCTIVITY (UMHOS)												
0.-1.5 M DEPTH	14	25.- 42.	38.	0.0- 1.5	16	35.- 57.	48.	0.0- 1.5	16	46.- 71.	52.	0.0- 1.5
MAX DEPTH**	7	29.- 45.	40.	7.9- 56.4	8	25.- 47.	40.	7.9- 54.3	8	37.- 47.	43.	8.2- 53.3
PH (STANDARD UNITS)												
0.-1.5 M DEPTH	14	6.7- 7.8	7.3	0.0- 1.5	16	7.7- 8.3	8.1	0.0- 1.5	16	7.2- 8.3	7.8	0.0- 1.5
MAX DEPTH**	7	7.0- 7.6	7.2	7.9- 56.4	8	7.1- 8.4	7.5	7.9- 54.3	8	6.6- 7.4	7.0	8.2- 53.3
TOTAL ALKALINITY (MG/L)												
0.-1.5 M DEPTH	14	14.- 25.	20.	0.0- 1.5	16	15.- 31.	23.	0.0- 1.5	16	17.- 30.	25.	0.0- 1.5
MAX DEPTH**	7	16.- 24.	19.	7.9- 56.4	8	15.- 31.	25.	7.9- 54.3	8	19.- 31.	25.	8.2- 53.3
TOTAL P (MG/L)												
0.-1.5 M DEPTH	14	0.016-0.052	0.038	0.0- 1.5	16	0.010-0.035	0.016	0.0- 1.5	16	0.006-0.028	0.012	0.0- 1.5
MAX DEPTH**	7	0.020-0.108	0.049	7.9- 56.4	8	0.017-0.034	0.019	7.9- 54.3	8	0.008-0.390	0.016	8.2- 53.3
DISSOLVED ORTHO P (MG/L)												
0.-1.5 M DEPTH	14	0.003-0.014	0.005	0.0- 1.5	16	0.004-0.015	0.010	0.0- 1.5	16	0.002-0.020	0.002	0.0- 1.5
MAX DEPTH**	7	0.003-0.020	0.008	7.9- 56.4	8	0.009-0.014	0.011	7.9- 54.3	8	0.002-0.013	0.002	8.2- 53.3
NO2+NO3 (MG/L)												
0.-1.5 M DEPTH	14	0.020-0.330	0.205	0.0- 1.5	16	0.020-0.020	0.020	0.0- 1.5	16	0.020-0.020	0.020	0.0- 1.5
MAX DEPTH**	7	0.020-0.390	0.190	7.9- 56.4	8	0.020-0.050	0.025	7.9- 54.3	8	0.020-0.140	0.030	8.2- 53.3
AMMONIA (MG/L)												
0.-1.5 M DEPTH	14	0.020-0.040	0.020	0.0- 1.5	16	0.020-0.040	0.020	0.0- 1.5	16	0.020-0.020	0.020	0.0- 1.5
MAX DEPTH**	7	0.020-0.040	0.020	7.9- 56.4	8	0.020-0.080	0.030	7.9- 54.3	8	0.020-0.020	0.020	8.2- 53.3
KJELDAHL N (MG/L)												
0.-1.5 M DEPTH	14	0.200-0.400	0.300	0.0- 1.5	16	0.200-0.600	0.300	0.0- 1.5	16	0.200-0.200	0.200	0.0- 1.5
MAX DEPTH**	7	0.200-0.400	0.200	7.9- 56.4	8	0.200-0.400	0.200	7.9- 54.3	8	0.200-0.400	0.200	8.2- 53.3
SECCHI DISC (METERS)	7	0.7- 3.7	1.5		8	2.4- 3.4	3.4		8	2.3- 5.8	4.2	

* N = NO. OF SAMPLES
** MAXIMUM DEPTH SAMPLED AT EACH SITE
*** S = NO. OF SITES SAMPLED ON THIS DATE

B. Biological Characterisitcs:

1. Phytoplankton -

Sampling Date	Dominant Genera		Algal Units per ml
04/04/75	1.	Melosira	9,594
	2.	Asterionella	592
	3.	Synedra	296
	4.	Fragilaria	85
	5.	Cryptomonas	42
		Other genera	42
		Total	10,651
07/22/75	1.	Melosira	389
	2.	Aphanizomenon	272
	3.	Fragilaria	272
	4.	Anabaena	233
	5.	Chroomonas	117
		Other genera	233
		Total	1,516
09/09/75	1.	Aphanizomenon	471
	2.	Tabellaria	471
	3.	Cryptomonas	118
	4.	Melosira	47
	5.	Synedra	47
		Other genera	95
		Total	1,249

2. Chlorophyll *a* -

Sampling Date	Station Number	Chlorophyll *a* (µg/l)
04/04/75	01	17.9
	02	17.0
	03	32.1
	04	----
	05	26.1
	06	18.2
	07	7.7
	08	1.9
07/22/75	01	3.8
	02	3.3
	03	3.8
	04	3.3
	05	4.2
	06	2.3
	07	3.1
	08	2.8
09/09/75	01	4.1
	02	5.9
	03	6.8
	04	10.3
	05	14.3
	06	16.0
	07	29.3
	08	4.8

C. Limiting Nutrient Study:

The algal assay results are not considered representative of conditions in the lake at the time the samples were collected (04/04/75, 09/09/75) due to significant changes in nitrogen and phosphorus levels in the samples during shipment from the field to the laboratory.

The lake data suggest phosphorus limitation during fall sampling (mean inorganic nitrogen to orthophosphorus ratio of approximately 17/1) and primary limitation by nitrogen during summer (N/P ratio of 5/1). During the spring primary limitation by nitrogen was suggested for Stations 01-03, and phosphorus limitation for Stations 05-08.

IV. NUTRIENT LOADINGS
(See Appendix D for data)

For the determination of nutrient loadings, the Idaho National Guard collected monthly near-surface grab samples from each of the tributary sites indicated on the map (page v), except for the high runoff months of June and July when two samples were collected. Sampling was begun in October 1974, and was completed in September 1975.

Through an interagency agreement, stream flow estimates for the year of sampling and a "normalized" or average year were provided by the Idaho District Office of the USGS for the tributary sites nearest the lake.

In this report, nutrient loads for sampled tributaries were determined by using a modification of a USGS program for calculating stream loadings. Nutrient loads indicated for tributaries are those measured minus known point source loads, if any.

Nutrient loadings for unsampled "minor tributaries and immediate drainage" ("ZZ" of USGS) were estimated by using the mean annual nutrient loads, in $kg/km^2/yr$, in Wolf Lodge Creek and Benewah Creek at Stations C-1 and F-1 and multiplying the means by the ZZ area in km^2.

The operators of the South Fork Coeur d'Alene Sewer District and St. Maries wastewater treatment plants provided monthly effluent samples and corresponding flow data. Nutrient loads for the city

of Santa wastewater treatment plant were estimated at 1.134 kg P and 3.401 kg N/capita/year. Nutrient loads for the Plummer and Harrison wastewater treatment plants were calculated using provided monthly effluent samples and estimated flow data.

A. Waste Sources:

1. Known Municipal -

Name	Pop.* Served	Treatment*	Mean Flow ($m^3/d \times 10^3$)	Receiving Water
South Fork Coeur d'Alene Sewer District	14,000	Activated Sludge	13.779	Coeur d'Alene River
St. Maries	2,900	Stabilization Pond	3.130	St. Joe River
Plummer	344	Stabilization Pond	0.130**	Plummer Creek
Santa	100	Stabilization Pond	0.038**	St. Maries River/ St. Joe River
Harrison	300	None	0.113**	Coeur d'Alene River

*Treatment plant questionnaires.
**Estimated at 0.3785 m^3/capita/day.

B. Annual Total Phosphorus Loading - Average Year:

1. Inputs -

Source	kg P/yr	% of total
a. Tributaries (nonpoint load) -		
C-1 Wolf Lodge Creek	780	0.4
D-1 Coeur d'Alene River	98,085	54.6
E-1 St. Joe River	56,325	31.3
F-1 Benewah Creek	930	0.5
G-1 Plummer Creek	435	0.2
H-1 Lake Creek	980	0.6
b. Minor tributaries and immediate drainage (nonpoint load) -	6,185	3.4
c. Known municipal STP's -		
South Fork Coeur d'Alene Sewer District	9,615	5.3
St. Maries	3,395	1.9
Plummer	335	0.2
Santa	115	0.1
Harrison	120	0.1
d. Septic tanks* -	250	0.1
e. Known industrial - None		
f. Direct precipitation** -	2,265	1.3
Totals	179,815	100.0%
2. Output - A-1 Spokane River	109,525	
3. Net annual P accumulation	70,290	

*Estimate based on 875 lakeshore residences, 4 camps and 1 park.
**Estimated (See NES Working Paper No. 175).

C. Annual Total Nitrogen Loading - Average Year:

1. Inputs -

Source		kg N/yr	% of total
a.	Tributaries (nonpoint load) -		
	C-1 Wolf Lodge Creek	24,810	0.7
	D-1 Coeur d'Alene River	1,492,530	43.9
	E-1 St. Joe River	1,483,900	43.7
	F-1 Benewah Creek	14,465	0.4
	G-1 Plummer Creek	12,285	0.4
	H-1 Lake Creek	36,605	1.1
b.	Minor tributaries and immediate drainage (nonpoint load) -	138,125	4.1
c.	Known municipal STP's -		
	South Fork Coeur d'Alene Sewer District	30,960	0.9
	St. Maries	12,400	0.4
	Plummer	575	<0.1
	Santa	340	<0.1
	Harrison	600	<0.1
d.	Septic tanks* -	9,325	0.3
e.	Known industrial - None		
f.	Direct precipitation** -	139,810	4.1
	Totals	3,396,730	100.0%

2. Outputs - A-1 Spokane River 4,354,550

3. Net annual N export*** - 957,820

*Estimate based on 875 lakeshore residences, 4 camps and 1 park.
**Estimated (See NES Working Paper No. 175).
***Export probably due to unknown sources and/or sampling error.

D. Mean Annual Nonpoint Nutrient Export by Subdrainage Area:

Tributary	kg P/km^2/yr	kg N/km^2/yr
Wolf Lodge Creek	5	162
Coeur d'Alene River	26	389
St. Joe River	13	331
Benewah Creek	7	106
Plummer Creek	4	109
Lake Creek	14	534

E. Mean Nutrient Concentrations in Ungaged Streams:

Tributary	Mean Total P (mg/l)	Mean Total N (mg/l)
B-1 Fernan Lake Outlet	0.042	0.743
J-1 Rockford Creek	0.053	1.180
K-1 Mica Creek	0.034	0.471
L-1 Murphy Creek*	0.170	7.690
M-1 Rose Creek*	0.192	3.307
N-1 Rose Creek*	0.241	3.151
P-1 South Fork Rock Creek*	0.173	3.384
Q-1 Cougar Creek	0.070	0.941
R-1 Cottonwood Creek	0.492	4.316
S-1 Squaw Creek	0.060	1.036

Nutrient levels in tributaries L-1 through P-1, (the special interest tributaries) and in Cottonwood Creek (R-1) are substantially higher than any of the other tributaries draining into Coeur d'Alene Lake which were sampled by NES in 1975. The reason for this inflation of nutrient levels is not known.

*Special interest tributaries which do not drain into Coeur d'Alene Lake.

E. Yearly Loadings:

In the following table, the existing phosphorus loading is compared to the relationship proposed by Vollenweider (1975). Essentially, his "eutrophic" loading is that at which the receiving waters would become eutrophic or remain eutrophic; his "oligotrophic" loading is that which would result in the receiving water remaining oligotrophic or becoming oligotrophic if morphometry permitted. A "mesotrophic" loading would be considered one between "eutrophic" and "oligotrophic."

Note that Vollenweider's model may not be applicable to water bodies with very short retention times or in which light penetration is severely restricted from high concentrations of suspended solids in the surface waters.

	Total Yearly Phosphorus Loading ($g/m^2/yr$)
Estimated loading for Coeur d'Alene Lake	1.39
Vollenweider's "eutrophic" loading	1.30
Vollenweider's "oligotrophic" loading	0.65

V. LITERATURE REVIEWED

Idaho Department of Health and Welfare. 1975. Idaho Water Quality Status. Division of Environment, Boise, Idaho.

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Martin, R.O.R. and Ronald L. Hanson. 1966. Reservoirs in the U.S. Geological Survey Water Supply Paper No. 1838. U.S. Government Printing Office, Washington, D.C.

Parker, J.E. 1972. Algae Production and Nutrient Enrichment in Lake Coeur d'Alene, Idaho. A thesis for the Master of Science degree in Zoology, University of Idaho.

U.S. Environmental Protection Agency. 1975. National Eutrophication Survey Methods 1973-1976. Working Paper No. 175. National Environmental Research Center, Las Vegas, Nevada, and Pacific Northwest Environmental Research Laboratory, Corvallis, Oregon.

Vollenweider, R.A. 1975. Input-Output Models With Special Reference to the Phosphorus Loading Concept in Limnology. Schweiz. Z. Hydrol. 37:53-84.

VI. APPENDICES

APPENDIX A

CONVERSION FACTORS

CONVERSION FACTORS

Hectares x 2.471 = acres

Kilometers x 0.6214 = miles

Meters x 3.281 = feet

Cubic meters x 8.107×10^{-4} = acre/feet

Square kilometers x 0.3861 = square miles

Cubic meters/sec x 35.315 = cubic feet/sec

Centimeters x 0.3937 = inches

Kilograms x 2.205 = pounds

Kilograms/square kilometer x 5.711 = lbs/square mile

APPENDIX B

TRIBUTARY FLOW DATA

TRIBUTARY FLOW INFORMATION FOR IDAHO 08/23/76

LAKE CODE 1603 COUER D'ALENE

TOTAL DRAINAGE AREA OF LAKE(SQ KM) 9945.6

TRIBUTARY	SUB-DRAINAGE AREA(SQ KM)	NORMALIZED FLOWS(CMS) JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
1603A1	9945.6	145.55	170.18	218.61	418.52	521.88	274.96	54.93	26.19	30.02	47.01	80.99	131.96	176.52
1603C1	153.1	0.934	2.662	3.936	4.248	3.483	1.388	0.311	0.085	0.085	0.113	0.255	0.368	1.479
1603D1	3833.2	51.54	69.66	90.05	208.70	208.98	78.44	25.77	13.48	11.78	16.93	35.96	58.33	72.37
1603E1	4480.7	52.10	68.81	95.71	238.99	317.71	166.22	48.70	21.92	17.87	23.53	41.63	60.03	96.11
1603F1	137.0	0.453	0.793	1.359	3.115	1.614	0.425	0.085	0.028	0.028	0.057	0.198	0.453	0.714
1603G1	112.4	0.142	0.283	0.566	1.699	0.708	0.113	0.011	0.003	0.003	0.008	0.057	0.142	0.310
1603H1	68.6	0.481	0.821	1.246	2.492	1.416	0.453	0.142	0.057	0.057	0.085	0.255	0.510	0.665
1603ZZ	1160.3	5.13	8.64	17.08	29.45	17.84	5.72	1.39	0.48	0.48	0.71	2.12	4.16	7.74

SUMMARY

TOTAL DRAINAGE AREA OF LAKE = 9945.6
SUM OF SUB-DRAINAGE AREAS = 9945.3

TOTAL FLOW IN = 2154.25
TOTAL FLOW OUT = 2120.79

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
1603A1	10	74	47.657	19	47.289				
	11	74	58.644	16	52.669				
	12	74	54.793	14	52.103				
	1	75	77.758	19	61.448				
	2	75	92.766	16	95.711				
	3	75	182.077	14	203.315				
	4	75	215.321	19	232.481				
	5	75	635.996	16	778.713				
	6	75	519.614	18	501.208	28	339.802		
	7	75	83.931	11	128.842	27	41.626		
	8	75	43.212	10	23.078				
	9	75	50.206	13	43.325				
1603C1	10	74	0.040	20	0.037				
	11	74	0.122	16	0.048				
	12	74	0.136	14	0.091				
	1	75	0.252	19	1.019				
	2	75	0.510	16	0.821				
	3	75	2.322	14	1.841				
	4	75	4.163	19	4.814				
	5	75	5.097	16	5.663				
	6	75	2.095	18	1.557	28	1.303		
	7	75	0.481	11	0.396	27	0.283		
	8	75	0.156	10	0.110				
	9	75	0.088	13	0.082				

LAKE CODE 1603 COUER D'ALENE

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
1603D1	10	74	12.063	20	11.808				
	11	74	22.087	16	13.167				
	12	74	20.813	15	17.302				
	1	75	29.959	19	93.021				
	2	75	32.734	16	54.368				
	3	75	73.765	14	58.050				
	4	75	134.590	19	160.840				
	5	75	381.428	16	699.992				
	6	75	200.710	18	133.712	28	87.641		
	7	75	45.335	11	47.799	27	26.788		
	8	75	21.011	10	19.284				
	9	75	14.158	13	13.649				
1603E1	10	74	15.659	20	14.980				
	11	74	18.887	16	15.178				
	12	74	17.217	15	15.688				
	1	75	29.733	16	25.315				
	2	75	28.317	8	19.171				
	3	75	51.820	14	42.475				
	4	75	105.905	19	116.665				
	5	75	378.879	16	657.234				
	6	75	321.396	18	238.428	28	162.256		
	7	75	81.553	11	86.366	27	51.253		
	8	75	36.812	10	34.547				
	9	75	21.634						
1603F1	10	74	0.028	20	0.028				
	11	74	0.057	16	0.028				
	12	74	0.057	15	0.057				
	1	75	0.368	18	3.002				
	2	75	0.255	15	0.680				
	3	75	0.566	15	0.311				
	4	75	1.699	19	1.614				
	5	75	4.446	17	7.617				
	6	75	1.104	7	1.982	22	0.481		
	7	75	0.142	12	0.142	26	0.057		
	8	75	0.085	10	0.057				
	9	75	0.057	6	0.057				
1603G1	10	74	0.006	20	0.006				
	11	74	0.008	16	0.006				
	12	74	0.011	14	0.006				
	1	75	0.085	18	0.821				
	2	75	0.057	15	0.142				
	3	75	0.113	15	0.057				
	4	75	0.425	19	0.396				
	5	75	1.274	17	2.350				
	6	75	0.255	7	0.510	22	0.113		
	7	75	0.025	12	0.028	26	0.011		
	8	75	0.011						
	9	75	0.006	6	0.008				

TRIBUTARY FLOW INFORMATION FOR IDAHO 08/23/76

LAKE CODE 1603 COEUR D'ALENE

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
1603H1	10	74	0.057	19	0.057				
	11	74	0.085	16	0.057				
	12	74	0.113	14	0.085				
	1	75	0.425	18	2.435				
	2	75	0.311	15	0.708				
	3	75	0.595	15	0.368				
	4	75	1.501	19	1.444				
	5	75	3.370	17	5.295				
	6	75	1.048	7	1.699	22	0.538		
	7	75	0.198	12	0.198	26	0.113		
	8	75	0.113						
	9	75	0.085	6	0.085				

STORET RETRIEVAL DATE 76/08/25
NATL EUTROPHICATION SURVEY
EPA-LAS VEGAS

160301
47 39 28.0 116 47 20.0 3
LAKE COEUR D'ALENE
16055 IDAHO
130391

11EPALES 2111202
0059 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/04/04	09 30	0000	3.3	13.0	108	37	7.65	17	0.020	0.300	0.020	0.005
	09 30	0005	3.3	12.8		38	7.65	16	0.020K	0.200	0.020K	0.004
	09 30	0025	3.4	13.0		40	7.60	16	0.020K	0.200K	0.020K	0.004
	09 30	0040	3.5	13.0		38	7.65	16	0.020K	0.200K	0.020K	0.004
	09 30	0055	3.5	12.8		40	7.50	16	0.020	0.200K	0.020K	0.004
75/07/22	10 00	0000	18.8	9.0	132	54	8.30	21	0.040	0.600	0.020K	0.013J
	10 00	0005	19.9	8.4		52	8.35	19	0.020	0.300	0.020K	0.011K
	10 00	0030	18.1	7.6		40	7.80	20	0.020	0.200K	0.020K	0.012K
	10 00	0035	10.4	9.4		40	7.50	19	0.020K	0.200K	0.020K	0.010J
	10 00	0061	7.5	8.8		40	8.40	23	0.030	0.200	0.020K	0.009
75/09/09	10 15	0000	18.9	8.8	228	49	7.30	17	0.020	0.200K	0.020K	0.002K
	10 15	0005	18.9	8.8		49	7.30	19	0.020K	0.200K	0.020K	0.002K
	10 15	0025	18.7	8.4		49	7.40	19	0.020K	0.200K	0.020K	0.002K
	10 15	0042	16.9	8.6		47	7.10	20	0.020K	0.200K	0.020K	0.002K

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/04/04	09 30	0000	0.020	17.9	
	09 30	0005	0.017		
	09 30	0025	0.017		
	09 30	0040	0.019		
	09 30	0055	0.021		
75/07/22	10 00	0000	0.013	3.8	
	10 00	0005	0.010		
	10 00	0030	0.011		
	10 00	0035	0.013		
	10 00	0061	0.017		
75/09/09	10 15	0000	0.011	4.1	
	10 15	0005	0.014		
	10 15	0025	0.010		
	10 15	0042	0.010		

K VALUE KNOWN TO BE LESS THAN INDICATED

J VALUE KNOWN TO BE ESTIMATED

APPENDIX C

PHYSICAL AND CHEMICAL DATA

STORET RETRIEVAL DATE 76/08/25
NATL EUTROPHICATION SURVEY
EPA-LAS VEGAS

160302
47 38 00.0 116 43 15.0 3
LAKE COEUR D'ALENE
16055 IDAHO

130391

11EPALES 2111202
0116 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/04/04	10 10	0000	3.4	12.8	144	38	7.60	20	0.020	0.200	0.030	0.004
	10 10	0005	3.4	12.6		37	7.60	21	0.020	0.200	0.030	0.003
	10 10	0025	3.5	13.2		37	7.60	22	0.020K	0.200K	0.020K	0.003
	10 10	0050	3.5	13.0		38	7.70	23	0.020K	0.200	0.020K	0.003
	10 10	0075	3.5	12.8		37	7.70	23	0.020K	0.200	0.020K	0.004
	10 10	0106	3.4	12.8		38	7.65	24	0.020K	0.200	0.020K	0.003
75/07/22	10 30	0000	20.1	6.6	108	50	8.25	23	0.030	0.400	0.020K	0.005
	10 30	0005	20.5	8.2		44	8.15	20	0.020K	0.200	0.020K	0.010
	10 30	0025	20.0	8.8		36	8.20	22	0.020K	0.200K	0.020K	0.010
	10 30	0035	10.9	6.8		33	7.45	22	0.020	0.200K	0.020K	0.012
	10 30	0075	6.2	7.4		37	7.35	23	0.040	0.200K	0.020K	0.013
	10 30	0112	4.7	8.4		40	7.70	27	0.060	0.200K	0.040	0.009
75/09/09	11 40	0000	18.9	8.8	228	49	7.20	19	0.020K	0.200K	0.020K	0.002K
	11 40	0005	18.7	8.8		49	7.20	18	0.020K	0.200K	0.020K	0.002K
	11 40	0015	18.6	9.2		49	7.35	20	0.020K	0.200K	0.020K	0.005
	11 40	0030	18.5	8.8		49	7.20	20	0.020K	0.200K	0.020K	0.002
	11 40	0045	13.1	9.2		43	6.90	19	0.020K	0.200K	0.020K	0.002K
	11 40	0080	8.3	8.0		45	6.75	19	0.020K	0.200K	0.020K	0.002K
	11 40	0111	7.1	7.2		43	6.65	19	0.020K	0.200K	0.120	0.003

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT RFMNING PERCENT
75/04/04	10 10	0000	0.016	17.0	
	10 10	0005	0.016		
	10 10	0025	0.025		
	10 10	0050	0.019		
	10 10	0075	0.023		
	10 10	0106	0.020		
75/07/22	10 30	0000	0.014	3.3	
	10 30	0005	0.011		
	10 30	0025	0.011		
	10 30	0035	0.010		
	10 30	0075	0.011		
	10 30	0112	0.030		
75/09/09	11 40	0000	0.009	5.9	
	11 40	0005	0.010		
	11 40	0015	0.012		
	11 40	0030	0.011		
	11 40	0045	0.013		
	11 40	0080	0.010		
	11 40	0111	0.019		

K VALUE KNOWN TO BE LESS THAN INDICATED

STORET RETRIEVAL DATE 76/08/25
NATL EUTROPHICATION SURVEY
EPA-LAS VEGAS

160303
47 35 30.0 116 48 28.0 3
LAKE COEUR D'ALENE
16055 IDAHO

130391

11EPALES 2111202
0189 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/04/04	10 55	0000	3.4	13.0	72	42	7.70	23	0.020K	0.300	0.020	0.004
	10 55	0005	3.3	13.0		42	7.80	20	0.020K	0.300	0.020K	0.004
	10 55	0015	3.3	13.0		42	7.70	19	0.020	0.200	0.020	0.009
	10 55	0075	3.3	13.0		42	7.70	17	0.020K	0.300	0.020	0.007
	10 55	0120	3.4	11.8		43	7.70	18	0.020K	0.200	0.020	0.005
	10 55	0185	3.4	12.2		44	7.50	16	0.030	0.400	0.070	0.020
75/07/22	11 05	0000	20.0	7.6	132	56	8.30	23	0.020	0.400	0.020K	0.013
	11 05	0005	19.6	9.0		48	7.90	23	0.020K	0.200K	0.020K	0.011
	11 05	0025	18.4	8.6		38	8.15	25	0.020	0.200	0.020K	0.013
	11 05	0030	11.9	9.2		30	7.60	25	0.020K	0.200K	0.020K	0.010
	11 05	0070	6.6	10.0		33	7.30	27	0.060	0.200	0.020	0.009
	11 05	0135	5.0	8.8		40	7.10	26	0.100	0.200	0.040	0.010
	11 05	0178	4.6	8.6		42	7.55	18	0.080	0.200	0.050	0.014
75/09/09	11 15	0000	18.9	8.4	180	51	7.85	18	0.020K	0.200K	0.020K	0.002K
	11 15	0005	18.7	9.0		59	7.85	26	0.020K	0.200K	0.020K	0.002K
	11 15	0024	18.3	9.0		47	7.80	27	0.020K	0.200K	0.020K	0.002K
	11 15	0045	13.7	8.4		45	7.45	27	0.020K	0.200K	0.020K	0.002K
	11 15	0080	8.1	8.0		45	7.10	28	0.020K	0.200K	0.020	0.002K
	11 15	0110	7.3	7.8		45	6.90	29	0.020K	0.200K	0.100	0.002K
	11 15	0140	7.2	7.0		47	6.70	28	0.020K	0.200K	0.120	0.002K
	11 15	0175	7.0	7.6		47	7.40	27	0.020K	0.200K	0.020K	0.002K

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT RFMNING PERCENT
75/04/04	10 55	0000	0.021	32.1	
	10 55	0005	0.022		
	10 55	0015	0.024		
	10 55	0075	0.023		
	10 55	0120	0.024		
	10 55	0185	0.108		
75/07/22	11 05	0000	0.016	3.8	
	11 05	0005	0.011		
	11 05	0025	0.011		
	11 05	0030	0.011		
	11 05	0070	0.011		
	11 05	0135	0.012		
	11 05	0178	0.021		
75/09/09	11 15	0000	0.006	6.8	
	11 15	0005	0.009		
	11 15	0024	0.009		
	11 15	0045	0.010		
	11 15	0080	0.012		
	11 15	0110	0.010		

K VALUE KNOWN TO BE LESS THAN INDICATED

STORET RETRIEVAL DATE 76/08/25
NATL EUTROPHICATION SURVEY
EPA-LAS VEGAS

160304
47 33 04.0 116 48 00.0 3
LAKE COEUR D'ALENE
16055 IDAHO

11EPALES 760109 2111202
0124 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/07/22	11 55	0000	21.7	9.4	132	53	8.30	18	0.030	0.400	0.020K	0.012
	11 55	0005	20.6	9.6		48	8.30	17	0.040	0.300	0.020K	0.004
	11 55	0020	19.9	9.0		45	8.30	16	0.020	0.300	0.020K	0.011
	11 55	0035	12.5	11.8		30	7.50	20	0.030	0.200	0.020K	0.008
	11 55	0080	6.5	9.6		37	7.30	20	0.100	0.300	0.040	0.010
	11 55	0120	5.6	9.0		45	7.50	22	0.060	0.400	0.030	0.013
75/09/09	11 45	0000	19.1	8.8	156	53	7.90	28	0.020K	0.200K	0.020K	0.002K
	11 45	0005	18.9	9.2		51	8.15	28	0.020K	0.200K	0.020K	0.002K
	11 45	0020	18.3	9.0		51	8.00	29	0.020K	0.200K	0.020K	0.002K
	11 45	0045	17.4	8.4		43	7.60	29	0.020K	0.200K	0.020K	0.002K
	11 45	0080	8.0	8.4		45	7.20	30	0.020K	0.200K	0.020K	0.002K
	11 45	0117	7.0			45	6.85	31	0.020K	0.200K	0.140	0.002K

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT RFMNING PERCENT
75/07/22	11 55	0000	0.015	3.3	
	11 55	0005	0.017		
	11 55	0020	0.015		
	11 55	0035	0.012		
	11 55	0080	0.012		
	11 55	0120	0.018		
75/09/09	11 45	0000	0.007	10.3	
	11 45	0005	0.008		
	11 45	0020	0.008		
	11 45	0045	0.008		
	11 45	0080	0.010		
	11 45	0117	0.012		

K VALUE KNOWN TO BE LESS THAN INDICATED .

STORET RETRIEVAL DATE 76/08/25
NATL EUTROPHICATION SURVEY
EPA-LAS VEGAS

160305
47 29 52.0 116 51 35.0 3
LAKE COEUR D'ALENE
16055 IDAHO

130391

11EPALES 2111202
0104 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/04/04	11 40	0000	3.9		59	37	7.30	24	0.020K	0.300	0.210	0.005
	11 40	0005	3.8	12.8		39	6.70	25	0.020K	0.200	0.210	0.005
	11 40	0040	3.8	12.8		39	7.45	24	0.020K	0.300	0.210	0.006
	11 40	0070	3.9	12.4		39	7.35	22	0.020K	0.300	0.220	0.007
	11 40	0100	4.1	12.0		43	7.20	19	0.020K	0.200	0.200	0.008
75/07/22	14 15	0000	18.8	9.4	132	57	8.00	24	0.040	0.500	0.020K	0.015
	14 15	0005	19.5	9.4		48	8.10	23	0.020	0.300	0.020K	0.010
	14 15	0015	17.5	9.6		38	8.15	23	0.020	0.300	0.020K	0.010
	14 15	0025	10.5	9.5		36	7.40	23	0.030	0.300	0.020K	0.010
	14 15	0080	5.1	9.6		40	7.25	26	0.060	0.300	0.040	0.004
	14 15	0107	4.3	10.6		47	8.00	26	0.030	0.300	0.020	0.011
75/09/09	14 20	0000	19.1	9.2	96	61	7.90	20	0.020K	0.200K	0.020K	0.002K
	14 20	0005	18.9	10.0		59	8.30	22	0.020K	0.200K	0.020K	0.002K
	14 20	0016	18.3	9.4		59	8.10	19	0.020K	0.200K	0.020K	0.002K
	14 20	0030	17.6	9.0		57	7.60	22	0.020	0.200	0.020K	0.007
	14 20	0050	11.3	7.2		41	7.30	22	0.020K	0.200K	0.020K	0.002
	14 20	0080	7.7	8.4		43	7.00	23	0.020K	0.200K	0.050	0.002K
	14 20	0108	7.2	7.0		43	6.80	22	0.020K	0.400	0.110	0.013

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT RFMNING PERCENT
75/04/04	11 40	0000	0.039	26.1	
	11 40	0005	0.038		
	11 40	0040	0.046		
	11 40	0070	0.045		
	11 40	0100	0.049		
75/07/22	14 15	0000	0.018	4.2	
	14 15	0005	0.015		
	14 15	0015	0.013		
	14 15	0025	0.039		
	14 15	0080	0.030		
	14 15	0107	0.032		
75/09/09	14 20	0000	0.012	14.3	
	14 20	0005	0.012		
	14 20	0016	0.012		
	14 20	0030	0.020		
	14 20	0050	0.012		
	14 20	0080	0.012		
	14 20	0108	0.390		

K VALUE KNOWN TO BE LESS THAN INDICATED

STORET RETRIEVAL DATE 76/08/25
NATL EUTROPHICATION SURVEY
EPA-LAS VEGAS

160306
47 27 10.0 116 49 53.0 3
LAKE COEUR D'ALENE
16055 IDAHO

130391

11EPALES 2111202
0054 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/04/04	11	10 0000	4.2	12.6	54	41	7.30	14	0.020K	0.400	0.220	0.009
	11	10 0005	4.2	12.6		41	7.20	14	0.020K	0.400	0.200	0.009
	11	10 0020	4.1	12.2		41	7.20	17	0.020K	0.200	0.200	0.009
	11	10 0035	3.9	12.2		39	7.00	23	0.020K	0.200	0.180	0.008
	11	10 0050	4.1	11.8		45	7.05	23	0.020K	0.200	0.190	0.008
75/07/22	14	45 0000	19.8	9.3	132	54	8.00	29	0.020	0.400	0.020K	0.010
	14	45 0005	19.4	9.2		48	7.90	28	0.030	0.200K	0.020K	0.013
	14	45 0015	18.0	9.4		49	7.55	28	0.020K	0.200K	0.020K	0.009
	14	45 0025	12.5	9.0		36	7.20	27	0.020	0.200K	0.020K	0.011
	14	45 0052	6.7	7.8		36	7.50	15	0.020	0.200K	0.040	0.010
75/09/09	14	45 0000	18.7	9.0	90	71	7.60	25	0.020K	0.200K	0.020K	0.002
	14	45 0005	18.3	9.0		62	7.85	25	0.020K	0.200K	0.020K	0.002K
	14	45 0015	18.0	9.4		69	7.80	25	0.020K	0.200K	0.020K	0.002K
	14	45 0035	17.4	9.2		61	7.15	26	0.020K	0.200K	0.020K	0.002K
	14	45 0051	10.6	7.4		42	7.30	24	0.020K	0.200K	0.020K	0.002K

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT RFMNING PERCENT
75/04/04	11	10 0000	0.044	18.2	
	11	10 0005	0.045		
	11	10 0020	0.052		
	11	10 0035	0.050		
	11	10 0050	0.053		
75/07/22	14	45 0000	0.035	2.3	
	14	45 0005	0.032		
	14	45 0015	0.039		
	14	45 0025	0.035		
	14	45 0052	0.034		
75/09/09	14	45 0000	0.028	16.0	
	14	45 0005	0.018		
	14	45 0015	0.025		
	14	45 0035	0.018		
	14	45 0051	0.014		

K VALUE KNOWN TO BE LESS THAN INDICATED

STORET RETRIEVAL DATE 76/08/25
NATL EUTROPHICATION SURVEY
EPA-LAS VEGAS

160307
47 24 52.0 116 45 15.0 3
LAKE COEUR D'ALENE
16055 IDAHO

130391

11EPALES 2111202
0050 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/04/04	10 30	0000	4.2	11.4	42	31	7.20	21	0.020K	0.300	0.270	0.010
	10 30	0005	4.1	11.4		31	7.20	17	0.030	0.300	0.250	0.014
	10 30	0015	4.0	11.4		33	7.20	15	0.020K	0.200	0.240	0.010
	10 30	0030	4.2	11.6		33	7.15	16	0.020K	0.200	0.250	0.009
	10 30	0045	4.0	11.4		35	7.00	16	0.020	0.200	0.240	0.010
75/07/22	15 15	0000	20.0	9.6	132	43	7.70	15	0.020	0.200	0.020K	0.010
	15 15	0005	19.8	9.7		42	7.80	27	0.020K	0.200K	0.020K	0.014J
	15 15	0015	14.6	10.2		41	7.60	27	0.020K	0.200K	0.020K	0.011J
	15 15	0035	11.1	9.4		36	7.40	25	0.030	0.200K	0.020K	0.010J
	15 15	0050	9.2	8.6		38	7.15	28	0.020	0.200K	0.020K	0.012J
75/09/09	15 15	0000	17.8	7.6	96	57	7.20	24	0.020K	0.200K	0.020K	0.020K
	15 15	0005	17.3	9.2		59	7.90	25	0.020K	0.200	0.020K	0.003
	15 15	0015	17.0	8.8		61	7.55	27	0.020K	0.200K	0.020K	0.002
	15 15	0030	15.7	7.4		53	7.20	26	0.020K	0.200K	0.020K	0.002K
	15 15	0050	10.0			41	6.90	25	0.020K	0.200K	0.040	0.002K

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/04/04	10 30	0000	0.043	7.7	
	10 30	0005	0.047		
	10 30	0015	0.046		
	10 30	0030	0.046		
	10 30	0045	0.042		
75/07/22	15 15	0000	0.032	3.1	
	15 15	0005	0.017		
	15 15	0015	0.016		
	15 15	0035	0.016		
	15 15	0050	0.018		
75/09/09	15 15	0000	0.014	29.3	
	15 15	0005	0.023		
	15 15	0015	0.036		
	15 15	0030	0.020		
	15 15	0050	0.019		

K VALUE KNOWN TO BE LESS THAN INDICATED

J VALUE KNOWN TO BE ESTIMATED

STORET RETRIEVAL DATE 76/08/25
NATL EUTROPHICATION SURVEY
EPA-LAS VEGAS

160308
47 21 50.0 116 45 10.0 3
LAKE COEUR D'ALENE
16009 IDAHO

130391

11EPALES 2111202
0030 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/04/04	09	35 0000	4.2	11.4	29	25	7.35	22	0.040	0.300	0.300	0.012
	09	35 0005	4.2	11.4		25	7.20	20	0.030	0.300	0.330	0.013
	09	35 0015	4.2	10.8		27	7.20	21	0.030	0.300	0.360	0.013
	09	35 0026	4.2	11.4		29	7.10	20	0.040	0.300	0.390	0.016
75/07/22	15	40 0000	20.6	9.2	96	35	8.20	31	0.040	0.400	0.020K	0.005
	15	40 0005	20.8	9.4		39	7.85	31	0.020K	0.200	0.020K	0.010J
	15	40 0015	15.6	8.6		30	7.40	31	0.020K	0.200K	0.020K	0.012J
	15	40 0026	10.1	8.6		25	7.40	31	0.020K	0.200K	0.020K	0.011J
75/09/09	15	50 0000	18.9	9.4	174	46	7.45	30	0.020K	0.200	0.020K	0.002K
	15	50 0005	18.3	9.0		46	7.70	29	0.020K	0.200K	0.020K	0.002K
	15	50 0018	17.6	9.2		45	7.50	30	0.020K	0.200K	0.020K	0.002K
	15	50 0027	13.3	2.8		37	7.10	29	0.020K	0.200K	0.020K	0.002K

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT RFMNING PERCENT
75/04/04	09	35 0000	0.052	1.9	
	09	35 0005	0.050		
	09	35 0015	0.058		
	09	35 0026	0.072		
75/07/22	15	40 0000	0.022	2.8	
	15	40 0005	0.019		
	15	40 0015	0.018		
	15	40 0026	0.017		
75/09/09	15	50 0000	0.016	4.8	
	15	50 0005	0.018		
	15	50 0018	0.016		
	15	50 0027	0.019		

K VALUE KNOWN TO BE LESS THAN INDICATED

J VALUE KNOWN TO BE ESTIMATED

APPENDIX D

TRIBUTARY AND WASTEWATER TREATMENT PLANT DATA

STORET RETRIEVAL DATE 76/08/25
NATL EUTROPHICATION SURVEY
EPA- LAS VEGAS

1603A1
47 42 10.0 116 58 40.0 4
SPOKANE RIVER
16 15 COEUR D'ALENE
O/COEUR D'ALENE LAKE 130391
BNK 1.5 MI SW OF POST FALLS
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/10/19	16	30	0.032	1.000	0.020	0.010	0.025
74/11/16	09	30	0.064	0.800	0.025	0.010	0.015
74/12/14	09	30	0.032	0.400	0.022	0.010	0.030
75/01/19	10	45	0.032	0.350	0.025	0.010	0.010
75/02/16	11	00	0.032	0.300	0.008K	0.015	0.015
75/03/14	10	40	0.010	0.350	0.015	0.010	0.020
75/04/19	08	30	0.005	1.200	0.060	0.005K	0.010
75/05/16	05	00	0.015	0.050K	0.020	0.010	0.020
75/06/18	09	00	0.005	0.650	0.020	0.005K	0.030
75/06/28	11	40	0.005	1.150	0.015	0.005K	0.010
75/07/11	10	30	0.005	1.150	0.010	0.005K	0.010K
75/07/27	10	00	0.015	0.300	0.015	0.010	0.030
75/08/10	10	00	0.005	0.150	0.005	0.010	0.030
75/09/13	10	00	0.020	2.400	0.030	0.010	0.030

K VALUE KNOWN TO BE LESS
THAN INDICATED

STORET RETRIEVAL DATE 76/09/25
NATL EUTROPHICATION SURVEY
EPA- LAS VEGAS

160381
47 40 15.0 116 45 05.0 4
FRENAN LAKE OUTLET
16 15 COEUR D'ALENE
T/COEUR D'ALENE LAKE 130391
HWY 10 BRDG AT SE EDGE OF COEUR D'ALENE
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/10/20	08	54	0.088	0.500	0.025	0.060	0.090
74/11/16	11	10	0.080	0.400	0.030	0.040	0.060
74/12/14	09	00	0.012	1.400	0.020	0.010	0.060
75/01/19	11	15	0.008	0.300	0.010	0.005K	0.010K
75/02/16	11	45	0.043	0.100K	0.008K	0.010	0.013
75/03/14	11	04	0.005	0.300	0.010	0.005K	0.020
75/04/19	12	15	0.005	1.350	0.025	0.005K	0.020
75/05/16	11	30	0.032	1.530	0.055	0.006	0.017
75/06/18	13	30	0.010	1.325	0.030	0.005	0.035
75/06/28	12	15	0.015	0.350	0.040	0.010	0.010
75/07/11	11	00	0.050	0.475	0.050	0.015	0.030
75/07/27	10	35	0.055	0.350	0.025	0.015	0.040
75/08/10	10	30	0.140	0.250	0.020	0.050	0.090
75/09/13	10	30	0.330	0.300	0.015	0.035	0.060

K VALUE KNOWN TO BE LESS
THAN INDICATED

STORET RETRIEVAL DATE 78/05/25
NATL EUTROPHICATION SURVEY
EPA- LAS VEGAS

1603C1
47 37 55.0 116 37 15.0 4
WOLF LODGE CREEK
16 15 LANE
T/COEUR D'ALENE LAKE 130391
RT 10 BRDG 10.5 MI ESE OF COEUR D'ALENE
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/10/20	09 20		0.024	0.100K	0.015	0.010	0.010
74/11/16	11 40		0.080	0.300	0.015	0.010	0.010
74/12/14	13 20		0.104	3.400	0.035	0.005	0.030
75/01/19	11 30		0.152	0.200	0.020	0.010	0.020
75/02/16	12 10		0.136	0.750	0.016	0.016	0.020
75/03/14	11 25		0.065	0.100	0.010	0.010	0.020
75/04/19	09 10		0.020	0.500	0.040		
75/05/16	12 00		0.035	0.100	0.050	0.025	0.030
75/06/18	14 00		0.015	0.450	0.025	0.010	0.020
75/06/28	12 40		0.015	0.600	0.025	0.005	0.010
75/07/11	11 45		0.030	0.150	0.015	0.010	0.010
75/07/27	13 05		0.025	0.450	0.020	0.010	0.020
75/08/10	11 00		0.015	0.175	0.010	0.015	0.015
75/09/13	13 45		0.025	0.100K	0.040	0.010	0.020

K VALUE KNOWN TO BE LESS
THAN INDICATED

STORET RETRIEVAL DATE 76/08/25
NATL EUTROPHICATION SURVEY
EPA- LAS VEGAS

16030I
47 28 45.0 116 44 00.0 4
COEUR D'ALENE CREEK
16 15 MT MARIES
T/COEUR D'ALENE LAKE 130391
BRDG ON CNTY RD AT SPRNGTN
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/10/20	10 36		0.009	0.100	0.015	0.010	0.030
74/11/16	15 00		0.144	0.800	0.060	0.010	0.030
74/12/15	10 00		0.152	0.600	0.105	0.005K	0.020
75/01/19	14 00		0.160	0.200	0.100	0.005	0.040
75/02/16	16 05		0.184	1.000	0.064	0.037	0.090
75/03/14	12 50		0.125	0.450	0.040	0.055	0.110
75/04/19	11 00		0.060	1.400	0.035	0.020	0.040
75/05/16	15 30		0.035	0.950	0.060	0.010	0.050
75/06/18	16 00		0.020	0.150	0.020	0.020	0.040
75/06/28	13 40		0.015	0.700	0.015	0.015	0.050
75/07/11	14 00		0.005	1.050	0.020	0.030	0.010
75/07/27	11 35		0.005	0.300	0.010	0.020	0.060
75/08/10	12 30		0.005	0.200	0.005K	0.020	0.070
75/09/13	12 15		0.010	0.100K	0.020	0.015	0.040

K VALUE KNOWN TO BE LESS
THAN INDICATED

STORET RETRIEVAL DATE 76/08/25
NATL EUTROPHICATION SURVEY
EPA- LAS VEGAS

1603E1
47 21 15.0 116 40 30.0 4
ST JOE RIVER
16 15 ST. MARIES
T/COEUR D'ALENE LAKE 130391
RNR 500 FT W OF DIKE RD 6.7 M NW ST MARS
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/10/20	11	22	0.016	0.500	0.010		0.030
74/11/16	15	40	0.032	0.500	0.020	0.005K	0.005
74/12/15	11	00	0.232	0.200	0.020	0.010	0.020
75/03/14	12	20	0.055	0.550	0.020	0.015	0.040
75/04/19	10	15	0.015	0.550	0.015	0.010	0.020
75/05/16	13	30	0.030	0.100	0.060	0.015	0.010
75/06/18	15	00	0.005	1.300	0.015	0.005	0.020
75/06/28	14	00	0.005	0.150	0.007	0.005	0.010K
75/07/11	13	00	0.005	0.500	0.020	0.010	0.010
75/07/27	12	05	0.005	0.300	0.005	0.005	0.020
75/08/10	13	30	0.005	0.200	0.025	0.010	0.040
75/09/13	12	45	0.005	0.100	0.015	0.005	0.010

K VALUE KNOWN TO BE LESS
THAN INDICATED

STORET RETRIEVAL DATE 76/08/25
NATL EUTROPHICATION SURVEY
EPA- LAS VEGAS

1603F1
47 20 10.0 116 40 56.0 4
BENEWAH CREEK
16 15 ST. MARIES
T/COEUR D'ALENE LAKE 130391
RT 5 BRDG 6 MI W OF ST MARIES
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/10/20	13	10	0.016	0.500	0.020	0.015	0.017
74/11/16	15	20	0.032	0.500	0.060	0.015	0.040
74/12/15	12	30	0.048	0.800	0.025	0.015	0.020
75/01/18	16	35	0.320	0.900	0.035	0.035	
75/02/15	13	50	0.200	0.500	0.032	0.024	0.080
75/03/15	15	45	0.050	0.800	0.020	0.020	0.060
75/04/19	17	00	0.030	1.150	0.020	0.020	
75/05/17	16	40	0.010	0.550	0.020	0.015	0.020
75/06/07	12	28	0.010	0.150	0.020	0.015	0.040
75/06/22	13	25	0.010	0.350	0.015	0.020	0.030
75/07/12	17	44	0.020	0.400	0.015	0.035	0.080
75/07/26	13	50	0.015	0.275	0.020	0.020	0.030
75/08/10	11	30	0.030	0.350	0.030	0.065	0.100
75/08/31	14	46	0.020	0.300	0.025	0.050	0.075
75/09/06	18	17	0.005	0.200	0.005	0.015	0.030

STORET RETRIEVAL DATE 76/08/23
NATL EUTROPHICATION SURVEY
EPA- LAS VEGAS

160361
47 21 30.0 116 47 30.0 4
PLUMMER CREEK
16 15 PLUMMER
T/COEUR D'ALENE LAKE 130391
4NW 7 MI NE OF PLUMMER
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/10/20	13 45		0.056	0.100	0.010	0.025	0.030
74/11/16	16 08		0.448	0.300	0.025	0.030	0.030
74/12/14	14 14		0.490	0.100K	0.010	0.020	0.040
75/01/18	16 15		2.000	1.600	0.085	0.060	
75/02/15	14 45		2.400	0.700	0.056	0.048	0.090
75/03/15	16 09		1.570	0.650	0.030	0.035	0.090
75/04/19	17 25		0.250	1.750	0.045	0.050	
75/05/17	17 15		0.010	0.250	0.015	0.030	0.050
75/06/07	12 45		0.015	0.600	0.020	0.030	0.060
75/06/22	13 09		0.020	1.100	0.020	0.045	0.090
75/07/12	18 10		0.010	1.000	0.050	0.040	0.040
75/07/26	14 15		0.005	0.250	0.010	0.010	0.040
75/08/31	14 40		0.045	0.700	0.050	0.055	0.070
75/09/06	18 43		0.005	0.100	0.010	0.005	0.020

K VALUE KNOWN TO BE LESS THAN INDICATED

STORET RETRIEVAL DATE 76/08/25
NATL EUTROPHICATION SURVEY
EPA- LAS VEGAS

1603H1
47 29 30.0 117 00 03.0 4
LAKE CREEK
16 15 FAIRFIELD WA
T/COEUR D'ALENE LAKE 130A92
BRDG .4 MI NW JCT W US RT 95
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/10/19	14	16	0.016	0.900	0.020	0.025	0.040
74/11/16	15	25	0.024	0.100	0.017	0.025	0.030
74/12/14	15	35	0.056	0.300	0.020	0.010	0.030
75/01/18	12	15	0.750	0.200	0.025	0.015	0.040
75/02/15	15	30	5.600	1.250	0.312	0.040	0.090
75/03/15	16	40	3.800	0.900	0.100	0.025	0.060
75/04/19	18	10	0.420	1.000	0.042	0.030	
75/05/17	15	55	0.020	0.350	0.030	0.010	0.020
75/06/07	11	50	0.010	0.400	0.030	0.010	0.040
75/06/22	12	35	0.010	5.500	0.085	0.020	0.020
75/07/12	16	57	0.025	0.400	0.025	0.055	0.070
75/07/26	13	10	0.015	0.350	0.015	0.055	0.090
75/08/31	13	46	0.040	0.550	0.050	0.065	0.080
75/09/06	17	50	0.005	2.800	0.047	0.030	0.060

STORET RETRIEVAL DATE 76/08/25
NATL EUTROPHICATION SURVEY
EPA- LAS VEGAS

1603J1
47 30 50.0 116 54 30.0 4
ROCKFORD CREEK
16 15 COEUR D'ALENE
T/COEUR D'ALENE LAKE 130391
SEC RD BRDG 16 MI SSW OF COEUR D'ALENE
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/10/10	14 55		0.020	0.200	0.010	0.035	0.040
74/11/16	15 07		0.010	0.100K	0.010	0.035	0.035
74/12/14			0.040	0.500	0.035	0.030	0.030
75/01/18	11 55		1.180	0.900	0.046	0.060	
75/02/15	15 55		2.800	0.700	0.048	0.040	0.100
75/03/15	17 05		2.100	0.500	0.030	0.030	0.060
75/04/19	18 25		0.530	1.300	0.030	0.025	
75/05/17	15 35		0.040	0.050K	0.015	0.020	0.020
75/06/07	11 35		0.005	0.100	0.015	0.020	0.030
75/06/22	12 14		0.030	0.350	0.015	0.030	0.040
75/07/12	16 34		0.100	1.700	0.055	0.055	0.080
75/07/26	12 50		0.045	0.400	0.015	0.050	0.060
75/08/31	13 30		0.040	0.500	0.075	0.065	0.070
75/09/06	17 26		0.005	0.100	0.010	0.030	0.065

K VALUE KNOWN TO BE LESS
THAN INDICATED

444

STORET RETRIEVAL DATE 76/08/25
NATL EUTROPHICATION SURVEY
EPA- LAS VEGAS

1603K1
47 35 50.0 116 53 10.0 4
MICA CREEK
16 15 COEUR D'ALENE
T/COEUR D'ALENE LAKE 130391
HWY 95 BRDG 8.5 MI SW COUER D'ALENE
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/10/19	15	26	0.024	0.300	0.025	0.020	0.050
74/11/16	14	48	0.024	0.300	0.025	0.015	0.015
74/12/14			0.032	0.500	0.025	0.010	0.010
75/01/18	11	20	0.176	0.300	0.024	0.025	0.060
75/02/15	16	20		0.200	0.024	0.024	0.060
75/03/15	17	19	0.045	0.150	0.010	0.020	0.030
75/04/19	18	45	0.050	1.800	0.020	0.020	
75/05/17	15	10	0.020	0.800	0.050	0.010	0.020
75/06/07	11	24	0.010	0.100	0.025	0.010	0.025
75/06/22	11	56	0.010	0.100	0.020	0.020	0.025
75/07/12	16	19	0.025	0.650	0.045	0.025	0.030
75/07/26	12	30	0.010	0.350	0.030	0.020	0.035
75/08/31	13	14	0.035	0.200	0.016	0.050	0.050
75/09/06	17	12	0.010	0.100	0.010	0.020	0.030

STORET RETRIEVAL DATE 76/08/25
NATL EUTROPHICATION SURVEY
EPA- LAS VEGAS

16031L
47 27 00.0 117 04 40.0 4
MURPHY CREEK
16 15 FAIRFIELD
T/COEUR D'ALENE LAKE 130892
SEC RD KING 2.3 MI E OF ROCKFORD
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
75/02/16	16	40	8.700	1.800	0.152	0.200	0.290
75/03/15	15	35	9.900	0.850	0.105	0.085	0.140
75/04/19	13	40	0.870	0.950	0.020	0.045	0.080

42

STORET RETRIEVAL DATE 76/08/25
NATL EUTROPHICATION SURVEY
EPA- LAS VEGAS

16031M
47 24 45.0 117 02 05.0 4
ROSE CREEK
16 15 FAIRFIELD
T/COEUR D'ALENE LAKE 130892
CHATCOLET RD XING .2 MI E WASH/ID BORDER
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
75/01/18	12	50	1.120	0.900	0.055	0.250	0.360
75/02/16	15	25	6.970	1.900	0.104	0.195	0.200
75/03/15	15	25	7.100	1.250	0.055	0.095	0.150
75/04/19	13	55	1.800	0.900	0.015	0.035	0.080
75/05/18	13	20	0.185	1.600	0.050	0.060	0.160
75/06/07	14	05	0.005	0.500	0.020	0.050	0.110
75/06/22	14	46	0.010	1.400	0.015	0.055	0.080
75/07/12	14	35	0.010	2.000	0.020	0.100	0.380
75/07/26	15	20	0.010	2.100	0.190	0.060	0.210

STORET RETRIEVAL DATE 76/08/25
NATL EUTROPHICATION SURVEY
EPA- LAS VEGAS

16031N
47 23 25.0 117 02 10.0 4
ROSE CREEK
16 15 FAIRFIELD
T/COEUR D'ALENE LAKE 130492
STATE LINE RD XING 6.5 MI E OF FAIRFIELD
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
75/01/18	13	15	0.650	0.600	0.060	0.250	0.300
75/02/16	15	45	7.230	1.700	0.128	0.136	0.160
75/03/15	15	40	5.800	0.800	0.050	0.085	0.150
75/04/19	14	10	1.800	1.350	0.085	0.035	0.080
75/05/18	13	30	0.175	1.250	0.115	0.085	0.400
75/06/08	14	20	0.005	1.150	0.035	0.075	0.280
75/06/22	15	00	0.150	0.750	0.025	0.010	0.120
75/07/12	14	45	0.045	1.750	0.095	0.173	0.440

STORET RETRIEVAL DATE 76/08/25
NATL EUTROPHICATION SURVEY
EPA- LAS VEGAS

16031P
47 22 05.0 117 06 10.0 4
ROSE CREEK
16 15 FAIRFIELD
T/COEUR D'ALENE LAKE 130892
TRIAX RD XING 3.5 MI ESE OF ROCHFORD
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
75/01/18	13	50	4.180	1.350	0.190	0.135	0.470
75/02/16	16	05	8.280	1.700	0.160	0.088	0.170
75/03/15	15	05	5.200	0.700	0.022	0.060	0.120
75/04/19	14	35	2.200	1.100	0.045	0.035	0.180
75/05/18	13	55	0.125	0.300	0.015	0.020	0.060
75/06/08	14	45	0.260	1.450	0.050	0.015	0.060
75/06/22	15	15	0.020	1.550	0.020	0.035	0.035
75/07/12	15	10	0.155	2.300	0.040	0.040	0.280
75/07/26	15	55	0.140	2.600	0.130	0.060	0.330
75/08/09	13	15	0.260	1.100	0.050	0.030	0.160
75/09/21	14	30	0.350	1.900	0.035	0.015	0.040

STORET RETRIEVAL DATE 75/08/25
NATL EUTROPHICATION SURVEY
EPA- LAS VEGAS

160391
47 39 30.0 116 50 40.0 4
COUGAR CREEK
16 15 COEUR D'ALENE
T/LAKE COEUR D'ALENE 130391
US RT 95 BRDG 3.5 MI SW OF COEUR D'ALENE
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/10/19	15	50	0.024	0.900	0.015	0.030	0.040
74/11/17	14	15	0.016	0.300	0.020	0.025	0.025
74/12/14	12	45	0.040	0.700	0.020	0.020	0.040
75/01/18	11	00	0.219		0.035	0.040	
75/02/15	16	40	0.430	0.500	0.024	0.056	0.150
75/03/15	17	35	0.320	0.450	0.015	0.040	0.090
75/04/19	19	05	0.100	1.750	0.025	0.045	
75/05/17	14	45	0.020	1.050	0.045	0.020	0.080
75/06/07	11	09	0.010	0.100	0.015	0.025	0.060
75/06/22	11	10	0.015	0.100	0.030	0.030	0.060
75/07/12	16	00	0.065	0.950	0.040	0.065	0.100
75/07/26	12	15	0.030	0.500	0.310	0.055	0.035
75/08/31	13	00	0.040	2.100	0.035	0.080	0.090
75/09/06	16	50	0.020	1.700	0.040	0.045	0.070

STORET RETRIEVAL DATE 76/08/25
NATL EUTROPHICATION SURVEY
EPA- LAS VEGAS

1603R1
47 26 30.0 116 50 20.0 4
COTTONWOOD CREEK
16 15 PLUMMER
T/LAKE COEUR D'ALENE 130391
DIRT RD BRDG 4.0 MI W OF WORLEY
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
75/01/18	15	20	2.610	0.700	0.040	0.075	0.260
75/02/16	14	35	6.210	0.900	0.072	0.088	0.100
75/03/15	14	50	3.670	3.300	0.030	0.060	0.280
75/04/19	15	30	0.345	2.800	0.050	0.130	1.800
75/05/18	14	40	0.005	1.040	0.050	0.010	0.020

STORET RETRIEVAL DATE 76/08/25
NATL EUTROPHICATION SURVEY
EPA- LAS VEGAS

1603S1
47 24 20.0 116 46 25.0 4
SQUAW CREEK
16 1S PLUMMER
T/LAKE COEUR D'ALENE 130391
BANK SEC RD 7.0 MI NW OF PLUMMER
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/11/17	14 00		0.008	1.600	0.183	0.020	0.050
75/01/19	15 00		0.400	0.300	0.015	0.035	0.060
75/02/16	14 00		0.274	1.200	0.032	0.032	0.078
75/03/14	13 30		0.115	0.375	0.010	0.030	0.065
75/04/19	12 00		0.045	1.150	0.020	0.030	
75/05/16	09 00		0.010	0.250	0.035	0.020	0.030
75/06/18			0.015	0.250	0.020	0.035	0.050
75/06/28	13 00		0.040	0.950	0.015	0.005	0.040
75/07/11	14 30		0.060	2.200	0.045	0.060	0.090
75/07/27	13 35		0.040		0.030	0.060	0.075
75/09/13	11 15		0.020	1.100	0.025	0.045	0.060

STORET RETRIEVAL DATE 76/08/25
NATL EUTROPHICATION SURVEY
EPA- LAS VEGAS

1603DA AS1603DA P014000
47 33 10.0 116 12 00.0 4
WALLACE
16 15 KELLOGG
T/COEUR D'ALENE RES 130391
COEUR D'ALENE RES
11EPALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
75/01/23	12 45		0.960	6.500	1.950	1.600	2.200	3.000	2.600
75/03/04	16 00		0.080	4.900	0.110		1.500	6.500	3.140
75/03/24	14 30		0.800	4.150	1.280	0.770	1.525	5.800	5.500
75/04/25	11 00		0.550	4.700	0.520	0.860	1.900	5.500	4.200
75/05/20	14 30		0.600	5.200	0.150	0.910	1.400	5.800	5.500
75/06/24	11 00		0.400	4.700	0.310	1.050	1.400	4.700	5.000
75/08/20	15 00		1.400	4.300	0.690	2.200	2.600	2.600	2.470
75/09/23	13 30		1.570	5.000	0.770	2.400	2.700	2.340	2.470
75/10/20	15 30		1.100	8.600	0.722	2.150	3.000	2.340	2.520
75/11/17	16 00		1.175	9.600	0.125	2.200	2.950	3.150	3.000

STORET RETRIEVAL DATE 76/09/25
NATL EUTROPHICATION SURVEY
EPA- LAS VEGAS

1603EA PD1603EA P002900
47 19 30.0 116 34 50.0 4
ST MARIES
16 15 ST MARIES
T/COEUR D'ALENE RES 130391
ST JOE RIVER
11EPALES 2161204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
75/03/06	16	00	0.160	9.500	2.400	1.700	2.000	2.000	2.000
75/04/09	09	00	0.560	5.800	0.240	0.320	1.800	1.500	1.500
75/04/30	09	00	0.500	5.300	0.510	1.580	2.100	1.500	1.500
75/05/30	13	20	0.350	6.400	0.830	1.950	2.200	1.250	1.250
75/09/15	15	00	0.125	7.900	1.450	2.880	3.200	0.500	0.500
75/09/30	15	40	0.125	13.500	1.500	2.800	3.300	0.500	0.500
75/10/14	10	00	0.200	15.500	2.500	3.500	4.900	0.500	0.500
75/10/20	09	00	0.700	37.000	4.700	5.500	8.200	0.500	0.500
75/10/28	08	30	0.325	17.000	3.200	4.000	5.000	0.500	0.500
75/11/03	10	15	0.600	15.500	2.400	4.300	5.250	0.500	0.500
75/11/17	09	00	0.825	11.000	1.400	2.600	3.100	0.500	0.500
75/12/02	08	15	0.425	9.200	1.800	2.630	3.200	0.500	0.500
75/12/16	10	15	0.350	11.000	1.950	2.100	2.500	0.500	0.500

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STORET RETRIEVAL DATE 76/08/25
NATL EUTROPHICATION SURVEY
EPA- LAS VEGAS

16036A PD1603GA P000344
47 19 50.0 116 52 40.0 4
PLUMMER
16 15 PLUMMER
T/COEUR D'ALENE RES 130391
PLUMMER CREEK
11EPALES 2161204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
75/02/23			0.160	9.700	2.100	2.560	3.400		
75/03/27			0.320	9.500	1.900	2.500	3.700		
75/05/28	12 00		0.450	8.100	0.670	5.600	6.300		
75/06/16	13 00		0.150	12.000	1.100	0.250K	9.200		
75/08/05	17 30		0.150	18.000	1.200	8.700	10.500		
75/10/27	00 00		0.175	15.000	0.430	7.000	9.600		

K VALUE KNOWN TO BE LESS
THAN INDICATED

STORET RETRIEVAL DATE 75/05/23
NATL EUTROPHICATION SURVEY
EPA- LAS VEGAS

160321 N0160321 P000300
47 27 40.0 116 45 40.0 4
HARRISON
16 15 PLUMMER
D/COEUR D'ALENE RES 130391
COEUR D'ALENE RES
11EPALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
75/01/28	10	10	2.080	1.400	0.240	0.370	0.550		
75/02/28	10	30	2.000	2.100	0.590	0.440	0.630		
75/03/29	10	30	2.320	1.000K	0.880	0.470	0.550		
75/04/28	10	15	2.300	1.200	0.120	0.560	0.720		
75/07/14	15	00	0.175	15.700	0.050	2.500	5.900		
75/08/01	10	30	0.350	21.000	2.300	2.400	4.500		
75/08/29	10	30	0.250	22.000	0.975	2.300	4.400		
75/09/29	10	45	0.200	26.000	2.800	2.900	5.300		
75/10/28	10	15	0.300	14.000	0.820	1.880	3.700		
75/11/29	10	30	0.150	24.500	7.700	2.300	3.650		
76/01/05	10	00	0.675	14.500	0.750	1.700	3.275	0.300	0.300
76/01/28	14	00	0.050	13.000	1.400	1.800	2.700		
76/02/27	14	15	0.825	9.000	0.180	1.100	2.000		

K VALUE KNOWN TO BE LESS THAN INDICATED

APPENDIX E

PARAMETRIC RANKINGS OF LAKES SAMPLED BY NES IN 1975

STATE OF IDAHO

Mean or median values for six of the key parameters evaluated in establishing the trophic conditions of Idaho lakes sampled are presented to allow direct comparison of the ranking, by parameter, of each lake relative to the others. Median total phosphorus, median inorganic nitrogen and median dissolved orthophosphorus levels are expressed in mg/l. Chlorophyll a values are expressed in µg/l. To maintain consistent rank order with the preceding parameters, the mean Secchi disc depth, in inches, is subtracted from 500. Similarly, minimum dissolved oxygen values are subtracted from 15 to create table entries.

LAKE DATA TO BE USED IN RANKINGS

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS ORTHO P
1601	AMERICAN FALLS RESERVOIR	0.105	0.080	463.800	15.379	14.700	0.035
1602	CASCADE LAKE	0.032	0.060	415.067	8.081	14.800	0.009
1603	LAKE COEUR D'ALENE	0.017	0.040	380.348	10.391	12.200	0.005
1604	DWORSHAK RESERVOIR	0.010	0.080	401.866	2.420	7.400	0.009
1605	HAUSER	0.028	0.075	366.286	11.112	14.800	0.013
1606	HAYDEN LAKE	0.010	0.040	243.500	2.787	11.800	0.003
1607	ISLAND PARK RESERVOIR	0.034	0.050	391.778	9.322	12.800	0.012
1608	LAKE LOWELL	0.070	0.070	477.111	25.389	14.600	0.015
1609	MAGIC RESERVOIR	0.062	0.130	400.750	7.322	14.700	0.020
1610	PALISADES RESERVOIR	0.024	0.080	345.428	2.067	12.800	0.007
1611	LOWER PAYETTE	0.013	0.060	234.000	4.600	9.600	0.007
1612	LOWER TWIN LAKES	0.016	0.050	370.000	2.318	13.600	0.009
1613	UPPER TWIN LAKES	0.017	0.045	369.143	4.986	8.200	0.004

PERCENT OF LAKES WITH HIGHER VALUES (NUMBER OF LAKES WITH HIGHER VALUES)

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS ORTHO P
1601	AMERICAN FALLS RESERVOIR	0 (0)	17 (1)	8 (1)	8 (1)	21 (2)	0 (0)
1602	CASCADE LAKE	33 (4)	54 (6)	17 (2)	42 (5)	4 (0)	50 (5)
1603	LAKE COEUR D'ALENE	67 (8)	96 (11)	50 (6)	25 (3)	67 (8)	83 (10)
1604	DWORSHAK RESERVOIR	96 (11)	17 (1)	25 (3)	83 (10)	100 (12)	50 (5)
1605	HAUSER	42 (5)	33 (4)	75 (9)	17 (2)	4 (0)	25 (3)
1606	HAYDEN LAKE	96 (11)	96 (11)	92 (11)	75 (9)	75 (9)	100 (12)
1607	ISLAND PARK RESERVOIR	25 (3)	71 (8)	42 (5)	33 (4)	54 (6)	33 (4)
1608	LAKE LOWELL	8 (1)	42 (5)	0 (0)	0 (0)	33 (4)	17 (2)
1609	MAGIC RESERVOIR	17 (2)	0 (0)	33 (4)	50 (6)	21 (2)	8 (1)
1610	PALISADES RESERVOIR	50 (6)	17 (1)	83 (10)	100 (12)	54 (6)	75 (9)
1611	LOWER PAYETTE	83 (10)	54 (6)	100 (12)	67 (8)	83 (10)	67 (8)
1612	LOWER TWIN LAKES	75 (9)	71 (8)	58 (7)	92 (11)	42 (5)	50 (5)
1613	UPPER TWIN LAKES	58 (7)	83 (10)	67 (8)	58 (7)	92 (11)	92 (11)